This listing of claims replaces all prior versions and listings of the claims in the application.

In the Claims

1. (currently amended) A ~~method of providing electrical isolation in a~~ separation by ion implanted oxide (SIMOX) method of forming a buried oxide layer of a semiconductor-on-insulator ("SOI") substrate, comprising:

implanting, at least one time, a base dose including oxygen ions ~~into a substrate in a base dose implant conducted~~ at a first energy level into a buried region disposed below a major surface of a semiconductor substrate to form an oxygen-implanted region;

implanting, at least one time, a second dose including at least one of oxygen ions and nitrogen ions into said oxygen-implanted region ~~substrate~~ at a second energy level ~~in a second implant~~ while maintaining said substrate ~~is held~~ at room temperature; and

annealing said ~~implanted~~ substrate to cause said ions implanted by said steps of implanting said base dose and said second dose to be redistributed in said substrate and to react with a material of said substrate to form a buried oxide ("BOX") layer in said oxygen-implanted region, said BOX layer electrically isolating a semiconductor layer of said substrate disposed above said BOX layer from a semiconductor region of said substrate disposed below said BOX layer.

2. (currently amended) The method of Claim 1 wherein said semiconductor layer of said substrate ~~comprises~~ disposed above said BOX layer consists essentially of single crystal silicon and said BOX layer includes silicon dioxide.

3-6. (canceled)

7. (currently amended) The method of Claim 1, wherein said first energy level and said second energy ~~levels~~ are in ~~the~~ a range between about ~~of~~ 40 KeV to about 240 KeV.

8. (currently amended) The method of Claim 1, wherein said second dose has a lower value than said base dose~~a lower dosage of ions are implanted in said second implant than in said base dose implant~~.

9-20. (canceled)

21. (new) The method as claimed in claim 1, wherein at least one of said base dose and said second dose is implanted a plurality of times and said method further comprises cleaning said substrate between successive times of said plurality of times.

22. (new) The method as claimed in claim 1, wherein said second energy level is set lower than said first energy level by up to about 10%.

23. (new) The method as claimed in claim 1, wherein said second dose is implanted a plurality of times, said method further comprising varying said second energy level from one time of said plurality of times to another time of said plurality of times.

24. (new) The method as claimed in claim 23, wherein said step of varying said second energy level includes decreasing said second energy level for each succeeding time of said plurality of times from said second energy level of one time of said plurality of times which immediately precedes said succeeding time.

25. (new) The method as claimed in claim 24, wherein said first energy level is higher than said second energy level for all of said plurality of times.

26. (new) The method as claimed in claim 23, wherein said base dose is implanted a plurality of times, said method further comprising varying said first energy level from one time of said plurality of times of implanting said base dose to another time of said

plurality of times of implanting said base dose, wherein said first energy level for each of said plurality of times of implanting said base dose is higher than said second energy level for each of said plurality of times of implanting said second dose.